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ABSTRACT

Suggestions are offered regarding the use and selection of software with LD (learning disabled) students. The scarcity of appropriate software for the population is pointed out and a hybrid selection scale based upon several existing scales is described. It is noted that the major reason for rejecting software is the high readability skill required of the user to follow directions. Results of reviews of software are summarized, and reviewers' requirements are noted, including educational soundness, flexibility, and adaptability to the peer teaching process. Appended are a list of software evaluation sources and/or directories, the sample evaluation scale, a list of software programs recommended for LD students in seven topic areas: microcomputer introduction; typing; quiz or lesson generators; word processing, cognitive, perceptual, spatial; language arts and reading; and mathematics, a list of software publishers. (CL)

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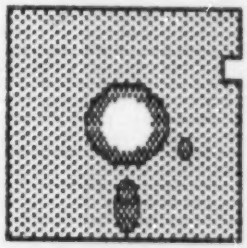
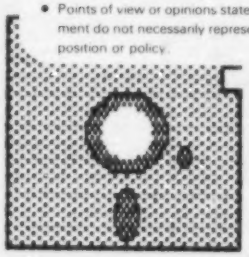
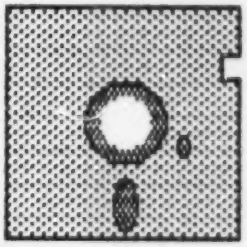
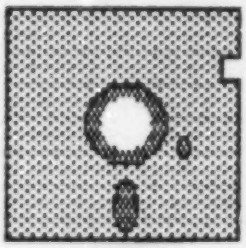




SOFTWARE PROGRAMS AND THE LEARNING DISABLED STUDENT





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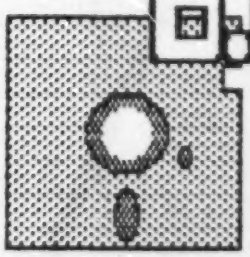

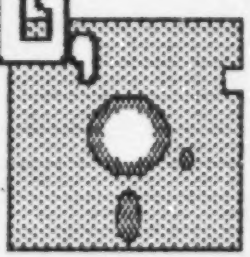

February 1985

SOFTWARE PROGRAMS AND THE LEARNING DISABLED STUDENT

It is with increasing frustration that many professionals seek-out computer-assisted instructional software for learning disabled individuals. The majority of existing educational software simply does not meet the specific needs of this population. Even among those programs touted as designed for remedial purposes, several problems exist. Many are boring, unimaginative, provide directions in reading-levels too difficult for the intended user, are immature, and/or are educationally unsound. Methodologies that are employed in special curriculum materials for LD students have not yet found their way into most software programs.

This is not to say that even at its present level of development microcomputers cannot fill an important role in the education of students with learning problems. Its greatest contributions to special learners may defy statistics. Indeed, the most solid gains from computer use may be quite intangible (Uslan, 1983). There are several unique advantages afforded by microcomputers for this population. Some of these advantages include immediate reinforcement of student responses, individual pacing, non-emotional input during needed repetitions, undivided attention during input, nonjudgmental responses, and intrinsic motivation. When right, microcomputer software can provide excellent drill and practice, simulations and problem solving programs.

These strengths make the microcomputer a compelling teaching device and one that warrants continued development of appropriate software for our LD population. Unfortunately, major software-producing companies are not attracted to creating programs for just this population as the monetary rewards for generating such software are not as great as in other areas (ie: general entertainment games). The very nature of learning disabilities, the myriad forms in which these conditions may exist, also hampers software development in this area. On the positive side, the Department of Education has given five million dollars of federal funds to contractors to adopt and write courseware for the general special education population (Roberts, 1983). Despite the increase in government aid for the development of appropriate software, it is unrealistic to expect a great flood of programs for the L.D. population to appear in the very near future. This trend implies that those teachers who now want to begin using computer assisted instructional software for persons with learning disabilities will have to turn to existing programs, whether or not this software has been specifically designed for the LD population.

In order to select the most appropriate software programs, a system should be used for evaluating and selecting microcomputer courseware. There are several sources (Table A) that offer courseware reviews and/or identify available software (Roberts, 1983, Hoffman, 1983, Uslan, 1983). After selecting those programs that appear to meet the general needs of your LD population, it is crucial to apply a formal evaluation tool.

An evaluation screening tool that has proved useful in this capacity is a hybrid scale developed by the author and based upon several existing software evaluation scales (see Table B). This quick evaluation tool has been successfully utilized by teachers on the campus in graduate-level courses and in their own special classes. As with any screening device, the benefits of its brevity also tend to negate some positive factors a more lengthy evaluation process might develop.

The majority of the software evaluated was originally designed for general education; scores have fallen in the low 70's and many programs have not wholeheartedly been recommended. Only some teacher utilities and word processing systems received very favorable reviews. The major problem with most rejected software centered on the high readability skills required of the user to follow directions. This was true even on supposedly remedial- skill programs. The reviewer consensus was that a reading-level of high-third or better was necessary for a user to function independently with current software programs. A heterogeneous peer-teaming, aide or teacher supervision was deemed necessary to allow low reading-level students to appropriately utilize the majority of this software.

There was a great deal of commonality between reviewers as to some features they demanded from computer assisted instructional software. First, the reviewers looked for the educational soundness of the material. Next, they wanted user-friendliness; this included ease of use for the novice computer user and clear, readable (5th reading level or less) directions. Reviewers

also preferred software to be flexible; because of the expense of most commercial software (public domain software was excluded from teacher review), teachers wanted versatile software that could be used more than once with a pupil, would allow teacher-input of problems, spelling words, etc., and could be used over a variety of subjects. Lastly, reviewers wanted software programs, after students had mastered their content, to be adaptable for student-input of problems, materials, etc.; the concept of using software as part of the peer-teaching process was strongly endorsed.

Software that was found to be generally useful with LD students are listed by recommended category (Table C). It is important to note that evaluator-subjectivity varied based upon the needs and abilities of their own students or situation. Teacher utilities and word processing systems received the best overall teacher evaluations. Next, the evaluators rated mathematical programs as being more successful with their LD students than the currently available reading or language arts programs. The top five rated programs, in descending order were: 1. Magic Slate (word processing): 2. Crossword Magic (teacher utility); 3. Academic Drill Builders (math and reading); 4. The Print Shop (cognitive spatial/teacher utility), and 5. BLOCKS (teacher utility). All programs were reviewed on an Apple II+ or IIe and are not inclusive of all available software in the education field.

Teachers of the LD are unlikely to meet all of their student's micro-computer needs through currently available software; they are going to have to become involved in the development of appropriate software. Unfortunately, software programming is exceedingly time-consuming and difficult. Most special educators do not have the programming expertise necessary to create even the simplest of programs. However, alternatives do exist. First, teachers must identify exactly what software needs exist for their particular situation. Next, they must objectify those needs. Third, special educators must prioritize on the basis of importance, over-all class utility and longevity of those needs. Teachers must then be able to identify community resources which are capable of developing software programs. Excellent sources are institutes of higher education (computer science majors are always looking for program ideas) and local computer-user groups. Educational software-developing companies continually seek ideas. Another important contact would be your State Department of Education; they should be able to serve as a resource network for personnel involved in microcomputer centers, projects or grants. The fifth step is to sit down with the identified programmer and explain exactly what you need. Sixth, determine what type of program (simulation, drill and practice, etc.) will be developed. Lastly, maintain constant communication with the programmer to assure that proper educational methodologies, goals, reading levels, objectives, multi-modality approach, etc. are being fulfilled. The end result should be a useful software program appropriate for LD students.

For those who wish to begin "yesterday" in providing appropriate microcomputer-aided lessons to learning disabled students, the recommended list of software should provide a base. Be aware that federal, state and private concerns are encouraging and funding software development for the handicapped; new material will become available over the next several years. Check educational periodicals, directories, magazines, etc. to keep abreast of these new software programs. Remember that microcomputer software is like any other educational tool: the selection and application must fit the needs of the individual learner. Choose that software which is flexible and able to be adapted to meet those needs posed by your particular students.

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Bowe, F.G. Personal Computers & Special Needs. Berkeley, CA: Sybex Press, 1984.

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Kosel, M. Designing educational microcomputer software: A model in use. Paper presented at the annual convention of the Association for Educational Data Systems, St. Louis, April 13-16, 1980. (ERIC Document Reproduction Service No. ED 192-718).

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Morgan, C.P. (Ed.). Popular computing. Rochelle Park, NJ: BYTE Publications, Inc./McGraw-Hill, Inc., 1983.

Moursund, D. (Ed.). The computing teacher. Eugene, OR: International Council for Computers in Education, 1983.

Ostertag, B.A. Microcomputing and Special Education. Sacramento, CA: Special Education Resource Network, 1984.

Roberts, J. (Ed.). How to find good software. Electronic learning, October 1982, Volume 2, Number 2, 40-44.

Roberts, J. (Ed.). The software line-up: what reviewers look for when evaluating software. Electronic learning. October 1982, Volume 2, Number 2, 45-48.

Roberts, J. (Ed.). Report sees use of micros in spec ed rising dramatically. Electronic learning, October 1983, Volume 3, Number 2, 18.

Sanders, R.L. and Sanders, M.E. Evaluating microcomputer software. CRLA, Summer, 1983, Volume 1, Number 1, 21-25.

Special Ware Directory, The. LINC Associates, Inc., Columbus, OH: 1983.

Sloane, E. Computer smorgasbord: FLDRS-South microcomputer evaluation form. A paper presented at the annual convention of the Council for Exceptional Children, Hartford, C.T., March, 1983.

Taber, F. Microcomputers in special education: Selection and decision making process. Reston, VA: CEC, 1983.

Uslan, D. The human element in computer use. The catalyst, January/February 1983, Volume 2, Number 1, 1.

Table A: Software Evaluation Sources and/or Directories

AEDS Bulletin
Association of Educational Data Systems
1201 Sixteenth Street, N.W.
Washington, D.C. 20036

Apple Journal of Courseware Review
Box 28426
San Jose, CA 95159

Atari Program Exchange
Atari, Inc.,
P. O. Box 427
155 Moffett Park Dr.
Sunnyvale, CA 94086

Classroom Computer News
Box 266
Cambridge, MA 92138

Commodore Software Encyclopedia
Commodore Business Machines
Software Group
681 Moore Rd.
300 Valley Forge Square
King of Prussia, PA 19406

Computers, Reading and Language Arts
Box 13247
Oakland, CA 94661

The Computing Teacher
Department of Computer Science
University of Oregon
Eugene, OR 97403

Courseware Report Card
150 West Carob Street
Compton, CA 90220

Directory of Microcomputer Software
Detapro Research
1895 Underwood Boulevard
Delran, NJ 08075

Electronic Learning
Scholastic Inc.
P. O. Box 645
Lyndhurst, NJ 07071-9986

EPIE Micro-Courseware Pro/Files
EPIE & Consumer's Union
Box 620
Stony Brook, NY 11790

Educational Software Director, Apple II Edition
Sterling Swift Publishing Co.
1600 Fortview Road
Austin, TX 78704

Electronic Education
1311 Executive Center Drive, Suite 220
Tallahassee, FL 32301

Microprocessor Software D.A.T.A. Book
D.A.T.A.
P. O. Box 26875
San Diego, CA 92126

MicroSoft Reviews
Northwest Regional Education Laboratories
300 S.W. Sixth Avenue
Portland, OR 97204

Popular Computing
70 Main Street
Petersborough, NH 03458

Radio Shack TRS-80 Applications Software Sourcebook
Radio Shack
Box 17400
Fort Worth, TX 76102

School Microware
Dresden Associates
P. O. Box 246
Dresden, ME 04342

Software and Services
Sourcebook and Supplement
Information Sources, Inc.
1807 Glenview Road
Glenview, IL 60025

Special Education Software
Review
c/o Drive One Publishers, Ltd.
3807 N. Northwood Ave.
Peoria, IL 61614

Special Net Edutech Bulletin Board
National Association of State
Directors of Special Education
1201 - 16th Street, NW
Washington, D.C. 20036

The Special Ware Directory
LINC Associates, Inc.
1875 Morse Road
Columbus, OH 43229

Teaching and Computers
c/o Scholastic, Inc.
P.O. Box 645
Lyndhurst, NJ 07071-9986

VanLove's 1983 Apple II/III
Software Director, Vol., II
Advanced Software
Technology, Inc.
7899 Mastin Drive
Overland Park, KS 66204

Table B: Microcomputer Software Evaluation Scale for L. D. Students

Subject Area/Topic: Date Evaluated:

Title: Date Published:

INTENDED ABILITY LEVEL: K 1 2 3 4 5 6 7 8 9 10 11 12 Adult Other___

INTENDED INTEREST LEVEL: K 1 2 3 4 5 6 7 8 9 10 11 12 Adult Other___

SOFTWARE MEMORY: 8K 16K 32K 48K 64K Other___

HARDWARE NEEDED: Apple Atari Commodore IBM PET TI TRS Other___

TRANSFER MEDIUM: Tape 5 1/4"Disk 8"Disk Cartridge Other_____

SUPPLEMENTAL REQUIREMENTS: Audio Color Graphics Joystick/Paddle Light Pen Printer Other_____

COST:

PUBLISHER:

REPRODUCTION PERMITTED: Yes No BACK-UP AVAILABLE: Yes No

TYPE OF PROGRAM: Authoring System Data Management Diagnosis/Assessment Drill and Practice Educational Game Game Problem Solving Simulation Tutorial Other_____

MENU DRIVEN: Yes No WRITTEN MANUAL: Yes No

KEY:

Excellent	Very Good	Good	Fair	Poor	Not Applicable
5	4	3	2	1	0

CONTENT:	5 4 3 2 1 0	1. Content based on Stated Behavioral Terms
	5 4 3 2 1 0	2. Content Accurate and Consistent
	5 4 3 2 1 0	3. Content Presentation Clear and Logical
	5 4 3 2 1 0	4. Racial, Ethnic and Sexist Stereotypes Avoided

EDUCATIONAL QUALITY:	5 4 3 2 1 0	5. Directions Clear
	5 4 3 2 1 0	6. Text at Intended Conceptual Level
	5 4 3 2 1 0	7. Text at Intended Reading Level
	5 4 3 2 1 0	8. Purpose of Material Defined
	5 4 3 2 1 0	9. Program Objectives Met
	5 4 3 2 1 0	10. Appropriate Feedback for Incorrect Responses
	5 4 3 2 1 0	11. Functions at User's Pace
	5 4 3 2 1 0	12. Size of Print Clear and Well-Spaced
	5 4 3 2 1 0	13. Multi-sensory Approach Used
	5 4 3 2 1 0	14. Material Relevant to User Needs
	5 4 3 2 1 0	15. Program Motivating
	5 4 3 2 1 0	16. Skills Taught Transferrable to Other Situations
GENERAL QUALITY:	5 4 3 2 1 0	17. Program Operation Uncomplicated
	5 4 3 2 1 0	18. Support Materials Effective and Comprehensive
	5 4 3 2 1 0	19. Program Reliable in Operation
	5 4 3 2 1 0	20. Material Effective with Individual Learning Styles

PROGRAM RATING TOTAL (Add items 1-20)

_____Score

90-100 = Excellent. Recommend Without Hesitation.

80-89 = Very Good. Worth Purchasing.

70-79 = Good. Consider Purchasing

60-69 = Fair. May Want to Wait for Something Better.

59 and below = Poor. Do Not Recommend Purchasing

PROGRAM EFFECTIVENESS

Recommended For LD Students Usage: Yes No

Reading Level Required: K 1 2 3 4 5 6 7 8 9 10 11 12 Adult

Estimated Interest Level: K 1 2 3 4 5 6 7 8 9 10 11 12 Adult

ADDITIONAL COMMENTS:

Table C: Software Programs Recommended for Use With the Learning Disabled

	PROGRAM	PUBLISHER
I.	Microcomputer Introduction	
	1. Apple Keyboard	Apple Computer
	2. Apple Presents Apple	Apple Computer
II.	Typing	
	3. Mastertype	Lightning Software
	4. Typing Strategy	Behavioral Engineering
	5. Typing Tutor II	Microsoft
III.	Quiz or Lesson Generators	
	6. BLOCKS	San Juan Unified Schools
	7. Crossword Magic	L&S Software
	8. Game Show	Computer Advanced Ideas
	9. Master Match	Computer Advanced Ideas
	10. Mix and Match	Apple Computer
	11. Tic Tac Show	Computer Advanced Ideas
IV.	Word Processing	
	12. Bank Street Speller	Broderbund Software
	13. Bank Street Writer	Broderbund Software
	14. Magic Slate	Sunburst Communications
	15. Milliken Word Processor	Milliken Publishing Company
V.	Cognitive, Perceptual, Spatial	
	16. Apple LOGO	Apple Computer
	17. Delta Drawing	Spinnaker Software
	18. Early Games for Young Children	Counterpoint Software, Inc.
	19. Facemaker	Spinnaker Software
	20. Gertrude's Puzzles	Learning Company
	21. Gertrude's Secrets	Learning Company
	22. Getting Ready to Read	Sunburst Communication
	23. Juggle's Rainbow	Learning Company
	24. KinderComp	Spinnaker Software
	25. Memory: The First Step in Problem Solving	Sunburst Communication
	26. Moptown	Learning Company
	27. Add One Out	Sunburst Communication
	28. Print Shop	Broderbund Software
VI.	Mathematics	
	29. Arcademic Drill Builders in Math Series	DLM/Teaching Resources
	30. Basic Living Skills Series	Love Publishing
	31. Basic Skills in Math Series	Learning Company
	32. Bumble Games	Learning Company
	33. Bumble Plot	Learning Company
	34. Calendar	Hartley Courseware
	35. Challenge Math	Sunburst, Inc.

36.	Clock	Hartley Courseware
37.	Division Skills	Milton Bradley Company
38.	Elementary Math	MECC
39.	FastMath	NTS Software
40.	Getting the Basics	NTS Software
41.	Math for Everyday Living	Educational Activities
42.	Mathematics	MECC
43.	Math Maze	Designware
44.	Survival Math	Sunburst Communications
45.	Teasers by Tobbs	Sunburst Communications
46.	Telling Time	Hartley Courseware
VII.	Language Arts and Reading	
47.	Aracademic Drill Builders in Language Arts	DLM
48.	Dragon Games	Educational Activities
49.	Dragon's Keep	Sunnyside Soft
50.	Early Words	Merry Bee Communications
51.	Elementary #7	MECC
52.	Sentences	Micro Power and Light
53.	Spellicopter	Designware
54.	Spellcaster	NTS Software
55.	Spelltronics Series	Educational Activities
56.	Sticky Bear ABC Series	Xerox
57.	Word Families	Hartley Courseware
58.	WordFlash	Ideatech
59.	WordMaster	NTS Software

Table D: Software Publishers

Apple Computer Company, Inc.
20525 Marianna Avenue
Cupertino, CA 95014

Behavioral Engineering
230 Mount Herman Road
Suite 207
Scotts Valley, CA 95066

Broderbund Software
1938 Fourth Street
San Rafael, CA 94901

Computer Assisted Ideas
1442A Walnut Street
Suite 341
Berkeley, CA 94709

Counterpoint Software, Inc.
4005 W. 65th Street
Minneapolis, CA 55435

Designware, Inc.
185 Berry Street
San Francisco, CA 94107

DLM Teaching Resources, Inc.
One DLM Park
Allen, TX 75002

Educational Activities, Inc.
P.O. Box 392
Freeport, NY 11520

Hartley Courseware, Inc.
Box 431
Dimondale, MI 48821

Ideatech Company
P.O. Box 62451
Sunnyvale, CA 94088

L&S Computerware
1589 Fraser Drive
Sunnyvale CA 94087

Learning Software
4370 Alpine Road
Portola Valley, CA 94025

Lightning Software
P.O. Box 11725
Palo Alto, CA 90436

Love Publishing Company
1777 South Bellaire Street
Denver, CO 80022

Merry Bee Communications
815 Crest Drive-Papillion
Omaha, NE 68046

MicroSoft Corporation
10700 Northrup Way
Bellevue, WA 98004

Milliken Publishing Company
1100 Research Boulevard
Box 21579
St. Louis, MO 63132-0579

Milton Bradley
443 Shaker Road
East Longmeadow, MA 01028

Minnesota Educational
Computer Consortium
2520 Broadway Drive
Highway 280 & Broadway
Saint Paul, MN 55113

MUSE
347 North Charles Street
Baltimore MD 21201

NTS Software
680 North Arrowhead Avenue
Rialto, CA 92376

San Juan Unified School
District
3738 Walnut Avenue
Carmichael, CA 95608

Spinnaker
215 First Street
Cambridge, MA 02142

Sunburst Communications
P.O. Box 40
Pleasantville, NY 10570

Sunnyside Soft
5815 East Parkway
Fresno, CA 93727

Xerox
Computer Software Division
246 Longhill Road
Middletown, CT 06457